

WHAT IS CLAIMED IS:

1. A digital camera comprising:
 - (a) a housing having a lens barrel movable along an optical axis;
 - (b) a zoom lens group and a focus lens group movable relative to one another along the optical axis in the lens barrel;
 - (c) a zoom motor connected to the lens barrel operable for moving the lens barrel to a position corresponding to a selected magnification;
 - (d) a focus motor connected to the focus lens group operable for

UNITED STATES PATENT AND TRADEMARK OFFICE
DOCUMENT CLASSIFICATION BARCODE SHEET



Claims

(h) an image sensor supported in the housing for receiving light through the lens groups, and operable for producing data in correspondence with light received through the lens groups for image recording.

2. The digital camera according to Claim 1, wherein if said voltage decrease is greater than the predetermined value, said controller drives one of said zoom motor and said focus motor to move one of said zoom lens group and said focus lens group to an initialization position, and then drives the other motor to move the other lens group to an initialization position.

3. The digital camera according to Claim 2, wherein when said voltage decrease is greater than the predetermined value, said controller drives said zoom motor to move said zoom lens group to an initialization position, and then drives said focus motor to move said focus lens group to an initialization position.

4. The digital camera according to Claim 1, wherein said controller includes a clock, the controller determining electric energy availability of the power source on the basis of at least one of a power source voltage value during power initiation and the voltage decrease when one of the lens cover driving motor and said zoom motor is driven, and when the electric energy energy availability is less than a predetermined amount, sets a lower clock frequency for the clock.

5. The digital camera according to Claim 1, wherein said controller stops said focus motor when said voltage value is less than the predetermined value during simultaneous operation of said zoom motor and said focus motor.

6. A digital camera comprising:

(a) a housing having a lens barrel movable along an optical axis;
(b) a zoom lens group and a focus lens group movable relative to one another along the optical axis in the lens barrel;

(c) a zoom motor connected to the lens barrel operable for moving the lens barrel to a position corresponding to a selected magnification;

(d) a focus motor connected to the focus lens group operable for moving the focus lens group to a focus position corresponding to the selected magnification;

(e) a lens cover movable between closed and open positions for protecting at least one lens, and a lens cover driving motor connected to the lens cover, operable for moving the lens cover between closed and open positions;

(f) an internal electric power source connectable to an AC power source;

(g) a controller connected to the internal electric power source, and controlling the zoom motor and the focus motor, the controller controlling the zoom motor and the focus motor to substantially

overlap in operation upon power initiation to move the lens groups to initialization positions if the internal electric power source is connected to an AC power source; and

(h) an image sensor supported in the housing for receiving light through the lens groups, the image sensor being operable for producing data in correspondence with light received through the lens group for image recording.

7. The digital camera according to Claim 6, wherein said controller determines whether or not an AC power source is connected to the internal power source, on the basis of a power source voltage value during power initiation and a voltage decrease when one of said lens cover driving motor and said zoom motor is operated.

8. The digital camera according to Claim 6, wherein said controller determines that the internal electric power source is connected to an AC power source if a voltage value is at least 2.9 V, and if so, thereafter controlling the zoom motor and focus motor to substantially overlap in operation to move the lens group to initialization positions.

9. The digital camera according to Claim 6, wherein said controller includes a clock, the controller determining an amount of electric energy available on the basis of at least one of a power source voltage value upon power initiation and a voltage decrease when one of the

lens cover driving motor and said zoom motor is driven, and when the electric energy available is less than a predetermined amount, sets a lower clock frequency for the clock.

10. A digital camera comprising:

- (a) an image reading element for recording an image;
- (b) lenses disposed for focusing an image on the image reading element;
- (c) a zoom motor connected to at least one of the lenses for lens movement to a magnification position;
- (d) a lens cover movable between a closed and open position for protecting at least one lens;
- (e) a lens cover driving motor connected to the lens cover and operable for moving the lens cover between open and closed positions;
- (f) an electric power source for supplying electrical power to the motors; and
- (g) a controller having a clock, the controller connected to the electric power source and controlling the image reading element, the controller determining an amount of electric energy available from the power source based on at least one of a power source voltage value during power initiation and a voltage decrease when one of the motors is operated, and when the electric energy available is determined to be less than a predetermined amount, the controller setting a lower clock speed.

11. A method for activating a digital camera having a zoom and focus lens group respectively driven by a zoom and focus motor, a lens cover driven by a lens cover driving motor, and a power source, the method comprising:

(a) determining a power source voltage available upon power initiation prior to driving any of the motors;

(b) operating at least one of the lens cover driving motor and the zoom motor during power initiation, and determining an amount of power source voltage decrease; and

(c) substantially overlapping operation of the zoom and focus motors to drive the zoom and focus lens group to initialization positions if the amount of power source voltage decrease is less than a predetermined amount.

12. The method of Claim 11, further comprising operating one of said zoom motor and said focus motor so as to move one of said lens groups to an initialization position when said power source voltage decrease is greater than a predetermined value, and then operating the other motor so as to move the other lens group to an initialization position.

13. The method of Claim 12, wherein said zoom motor is operated so as to move said zoom lens group to an initialization position when said power source voltage decreases is larger than the predetermined

value, and then operating said focus motor so as to move said focus lens group to an initialization position.

14. The method of Claim 12, wherein the digital camera includes a clock, further comprising:

determining an amount of electric energy available from the power source on the basis of at least one of a power source voltage value upon power initiation and the power source voltage decrease; and

setting a lower frequency for the clock in the amount of electric energy determined to be available is less than a predetermined amount.

15. The method of Claim 11, further comprising ceasing operation of said focus motor when said power source voltage is less than a predetermined value when said zoom motor and said focus motor are being operated simultaneously.

16. The method of Claim 11, further comprising:

determining whether the power source is connected to an alternating power source upon power initiation; and

substantially overlapping operation of said zoom motor and said focus motor so as to move said zoom lens group and said focus lens group to initialization positions if the power source is connected to an alternative power source.

17. The method of Claim 16, wherein determining whether the power source is connected to an alternating power source is determined on the basis of the power source voltage available upon power initiation and the amount of power source voltage decrease when one of said lens cover driving motor and said zoom motor is driven.

18. The method of Claim 16, wherein the power source is determined to be connected to the alternating power source if the power source voltage is at least 2.9 V.

19. The method of Claim 16, wherein the digital camera includes a clock, further comprising:

determining an amount of electric energy available from the power source on the basis of at least one of a power source voltage value upon power initiation and the power source voltage decrease; and

setting a lower frequency for the clock if the amount of electric energy determined to be available is less than a predetermined amount.

20. The method of Claim 11, wherein the digital camera includes a clock, further comprising:

determining an amount of electric energy available from the

power source on the basis of at least one of a power source voltage value upon power initiation and the power source voltage decrease; and

- setting a lower frequency for the clock if the amount of electric energy determined to be available is less than a predetermined amount.